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Bidirectional Transfer Study of Polystyrene Nanoparticles across the Placental Barrier in an *ex Vivo* Human Placental Perfusion Model

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Figure S1. Stability (A) and leakage (B) of the fluorescence dye was assessed after 3, 6, 24, 48 and 72 hrs of incubation at 37°C in perfusion medium. Shown are the mean percentages of initial (time point 0) fluorescence intensity ± SD (A) and the free fluorescence of the large PS particles as percentage of total fluorescence intensity ± SD (B), n=3. (C) Representative TEM micrographs of plain 50 nm, 240 nm and carboxylate-modified 300 nm PS beads in the fetal or maternal circulation after 1.5 - 6 hrs of normal (M to F direction) or reverse (F to M direction) perfusion.

Figure S2. BeWo cell viability after 3 (A) and 24 hrs (B) of exposure to PS beads measured with a MTS assay. $CdSO_4$ served as positive control for cytotoxicity. Data represent the mean percentages of viable cells compared to the untreated control ± SD of at least 3 independent experiments.

Figure S3. (A + B) Fetal-to-maternal (F/M) or maternal-to-fetal transfer ratio (M/F) of radiolabeled ^{14}C-antipyrine over a time period of 6 hrs of normal (A) or reverse (B) placenta perfusion with or without PS beads. (C + D) Glucose consumption and lactate production (C) and human chorionic gonadotropin (hCG) and leptin hormone production rate (D) during *ex vivo* human placental perfusion with or without particles (control). All data is expressed as the mean ± SD of at least 3 independent experiments.